REMARKS

Claims 1-25 are pending in this application, of which claims 12-21 have been withdrawn from consideration. Claims 1, 3, 7-8 and 10-11 have been amended. Claims 22-25 are newly-added.

Claims 7-8 and 10-11 stand rejected under 35 USC §112, second paragraph, as indefinite.

With regard to claims 10 and 11:

Claim 10 is directed to the semiconductor photodetecting device according to the modification of the seventh embodiment shown in FIG. 17A, in which the device lengths (the lengths of the light absorption layers) of the PIN photodiodes (photodetectors) are gradually larger as the PIN photodiodes are located farther from the tapered optical waveguide in the semiconductor photodetecting device having a plurality of the PIN photodiodes arranged serially in the direction of the propagation of light.

Claim 11 is directed to the semiconductor photodetecting device according to the modification of the seventh embodiment shown in FIG. 17B, in which the widths of the PIN photodiodes (photodetectors) gradually increase as the PIN photodiodes are located farther from the tapered optical waveguide in the semiconductor photodetecting device having a plurality of the PIN photodiodes arranged serially in the direction of the propagation of light.

Accordingly, claims 7-8 and 10-11 have been amended to correct the noted instances of indefiniteness, and the 35 USC §112, second paragraph, rejection should be withdrawn.

Claims 1, 7 and 8 stand rejected under 35 USC §102(b) as anticipated by U.S. PG-Pub 2002//003202 to Yasuoka (hereinafter "**Yasuoka**").

Applicants respectfully traverse this rejection.

In the semiconductor photodetecting device according to claim 1 of the instant application, the upper clad layer over the tapered core layer not only has a film thickness which gradually decreases toward the photodetector but also has a surface height which gradually decreases toward the photodetector.

On the other hand, **Yasuoka** only discloses the upper clad layer 20C having a surface height almost flat as shown in FIG. 2 or a surface height gradually increased toward the photodetector as shown FIG. 6. **Yasuoka** does not disclose the upper clad layer having a surface height which gradually decreases toward the photodetector.

Based on the structural difference in the upper clad layer between the present invention according to claim 1 and **Yasuoka**, the present invention has a technical advantage over **Yasuoka** in that the present invention copes with both the realization of high coupling efficiency between the tapered optical waveguide and an external optical waveguide such as a optical fiber, and the fabrication of the semiconductor photodetecting device with high yield.

In order to only realize the high coupling efficiency between the waveguide of the semiconductor photodetecting device and an external optical waveguide, the thick upper clad layer shown in FIG. 6 can be formed so that light losses at the light incidence end of the optical waveguide of the semiconductor photodetecting device are suppressed. However, when the thick upper clad layer is adopted, abnormal growth of the upper clad layer occurs near the photodetector, which

renders the patterning using a resist film difficult, as argued in detail in the specification.

In the present invention, the upper clad layer over the tapered core layer is formed having a film thickness which continuously decreases toward the photodetector and having a surface height which continuously decreases toward the photodetector, whereby high coupling efficiency between the waveguide of the semiconductor photodetecting device and an external optical waveguide is realized, while the abnormal growth of the upper clad layer near the photodetector, which might lead to low fabrication yield, is sufficiently suppressed.

Thus, the 35 USC §102(b) rejection should be withdrawn.

Claims 2-6 stand rejected under 35 USC §102(b) as anticipated by **Yasuoka**.

Applicants respectfully traverse this rejection.

The Examiner has urged that all the constituents of the semiconductor photodetecting device according to claim 2 are disclosed in **Yasuoka**.

Applicants respectfully disagree.

The Examiner regards the optical waveguide layer 28 disclosed in **Yasuoka** as the ridge-shaped optical waveguide in claim 2.

As disclosed in par. 0050 of **Yasuoka**, the cladding layer 20C covers the optical waveguide layer 20G including the optical waveguide layer 82. It is evident that cladding layer 20C covers the upper surface of the optical waveguide layer 28 with the layers 29, 30 therebetween and covers the side surface of the optical waveguide layer 28.

To the contrary, in the ridge-shaped optical waveguide in claim 2 of the instant application, which corresponds to the ridge-shaped connection optical waveguide portion 12b in the embodiments, the upper clad layer covers only selectively the upper surface of the core layer. Namely, the side surface of the core layer is exposed and not covered with the upper clad layer. Accordingly, it may be concluded that the relationship between the core layer and the clad layer in the ridge-shaped optical waveguide of claim 2 is completely different from that disclosed in **Yasuoka**. In addition, it must be pointed out that the optical waveguide layer 28 in **Yasuoka** is formed of undoped InGaAsP not including any clad layer (par. 0037), while the ridge-shaped optical waveguide of claim 2 includes both of the core layer and a clad layer.

The upper clad layer recited in claim 3 of the instant application differs from the upper clad layer 20C disclosed in **Yasuoka**, as discussed above regarding claim 1. The ridge-shaped optical waveguide recited in claim 3 differs from the optical waveguide layer 28 disclosed in **Yasuoka** as discussed above regarding claim 2. Accordingly, **Yasuoka** fails to disclose all of the features of the present invention according to claim 3.

Claims 4-8 and newly added claims 22-25 are dependent from any one of claims 1-3, and the present invention according to claims 1-3 completely differ from **Yasuoka** as described in detail above.

Thus, the 35 USC §102(b) rejection should be withdrawn.

Claims 9-11 stand rejected under 35 USC §103(a) as unpatentable over **Yasuoka** in view of U.S. Patent 6,528,776 to Marsland (hereinafter "**Marsland**").

Applicants respectfully traverse this rejection.

As described above, **Yasuoka** discloses a semiconductor photodetecting device completely different from the semiconductor photodetecting device according to claim 1 of the instant application. Claims 9-11 directly or indirectly depend form claim 1.

Therefore, even if, *arguendo*, **Marsland** discloses a plurality of the photodetectors optically coupled with each other, as the Examiner indicates, it is clear that the present invention according to claims 9-11 would have been unobvious to one of ordinary skill in the art at the time the invention was made.

Thus, the 35 USC §103(a) rejection should be withdrawn.

In view of the aforementioned amendments and accompanying remarks, claims 7-8 and 10-11, as amended, are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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Enclosures: Substitute Abstract of the Disclosure

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